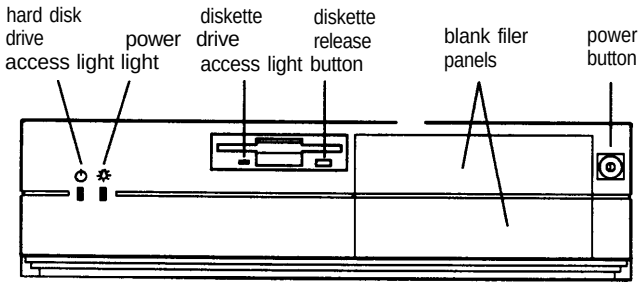
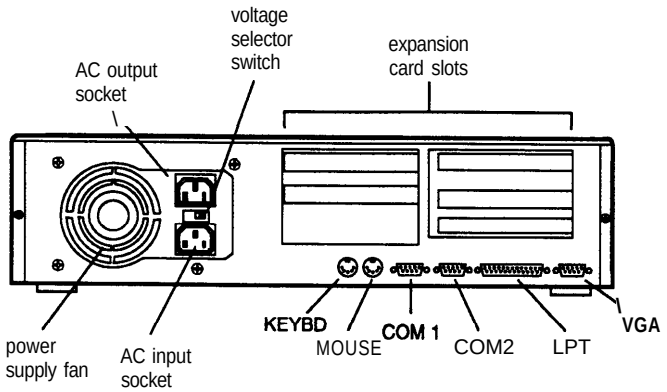




Computer Specifications

CPU and Memory

CPU	Intel Pentium 60 MHZ microprocessor; backward compatible with 8086, 80286, *I386,* and i486 CPUs; supports read and write burst mode bus cycles; built-in 16KB write-back cache; integrated math coprocessor
System speed	High and low speeds available; high speed is 60 MHz and low speed is simulated 8 MHz for compatibility; speed selection through Setup program or keyboard commands
System memory	8MB standard memory on two 4MB SIMMs; expandable to 128MB using 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs (when readily available); SIMMs must be 32-bit or 36-bit, 72-pin, 70ns or faster, tin-plated, fast-page mode, parity/no parity type
Cache memory	Built-in 16KB of internal write-back cache in the Pentium microprocessor; 256KB of secondary, direct-mapped, write-through cache on eight 32KB x 8, 15ns SRAMs on the main system board; tag and control logic on the 82434LX PCMC core chip
ROM	128KB system and video BIOS located on a flash EEPROM device; contains Setup program code, power-on self test code, update recovery code, and the PCI board auto-configuration utility; upgradable and write-protectable
Video RAM	1MB of standard video RAM providing video resolutions up to 1024 x 768 in 256 colors; expandable to 2MB by installing eight 256KB X 4, 60ns ZIP VRAMs on the main system board to provide resolutions up to 1280 X 1024 in 256 colors
Shadow RAM	Supports shadowing of system and video BIOS ROM, and ROM located on expansion board adapters, into RAM
Clock/ calendar	Real-time clock, calendar, and 128-byte CMOS RAM (114 bytes for general purpose non-volatile CMOS RAM and 14 bytes for clock and control registers) on socketed DS12887 device; integrated battery and oscillator; CMOS RAM clearable and resettable using the Setup program or by setting a main system board jumper

Controllers

Video	ATI 68800AX Mach32 local bus PCI graphics accelerator; compatible with MDA, CGA, Hercules Graphics, EGA, and VGA video standards; supports normal and enhanced video modes; supports interlaced and non-interlaced monitors
Diskette	SMC FDC37C665 super I/O controller with interface on the main system board controls up to two diskette drives or one diskette drive and one tape drive; 16-byte data FIFO (first-in-first-out) with 2.88MB diskette drive support
Hard disk	SMC FDC37C665 super I/O controller with interface on the main system board controls up to two IDE hard disk drives; BIOS provides hard disk auto-sensing function

Parallel port	SMC FDC37C665 super I/O controller provides multiple modes: standard (IBM and Centronics compatible), enhanced (EPP with bidirectional functions and BIOS/driver support), and high speed (ECP compatible)
Serial ports	SMC FDC37C665 super I/O controller supports two RS-232C compatible serial ports

Interfaces

Video	SVGA PCI local bus interface with standard, 15-pin analog connector; VESA compliant 8514/A feature connector on main system board for auxiliary video subsystem installed in an expansion slot
Parallel	Multimode, bidirectional parallel port with 25-pin, D-shell connector
serial	Two RS-232C compatible, programmable, asynchronous serial ports with 9-pin, D-shell connectors
Keyboard	PS/2 compatible keyboard port with 6-pin, mini DIN connector
Mouse	PS/2 compatible mouse port with 6-pin, mini DIN connector
Expansion slots	Five expansion slots on expansion board riser card: one full-length, 16-bit ISA slot; two half-length, 16-bit ISA slots; one full-length PCI slot, and one half-length PCI slot

Mass Storage

Internal bays: one 3.5-inch, one-inch high bay (for the standard diskette drive) and one 3.5-inch, 1.6-inch high bay for an optional internal drive in the drive carrier

Externally accessible bays: Two 5.25-inch half-height bays (can be used as one 5.25-inch, full-height bay)

Keyboard

Detachable, two-position height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys

Setup Program

Stored in ROM; accessible by pressing **F1** during boot

Physical Characteristics

Dimension	Specification
Width	17.2 inches (43.7 cm)
Depth	16.2 inches (41.1 cm)
Height	4.3 inches (11.0 cm)
Weight	**20 b** (9.1 kg) without drives or keyboard

Power Supply

Type	145 Watt, switchable voltage; maximum power dissipation: 120 Watts
Input ranges	90 to 135 VAC and 180 to 265 VAC; **50/60** Hz
AC input current	**5.0** Amps at 90 to 135 VAC; **3.0** Amps at 180 to 265 VAC
AC power outlet	2.0 Amps maximum for 100 to 120 VAC; 1 Amp maximum for 200 to 240 VAC
Cables	Two to main system board; four to mass storage devices

DC output

DC voltage	Maximum continuous current	Peak current; 15 seconds	Minimum current load
+5V	18.0 Amps	18.0 Amps	2.5 Amps
–5V	0.3 Amp	0.3 Amp	0 Amp
+12V	4.2 Amps	6.0 Amps	0.5 Amp
–12V	0.3 Amp	0.3 Amp	0 Amp

Power consumption

DC voltage	Current	Watts (total: 30.67)
+5V	6.0 Amps (5%)	30.0 w
-5V	0.016 Amp (5%)	0.008 w
+12 V	0.044 Amp (10%)	0.528 W
-12V	0.011 Amp (10%)	0.132 W
3.3 v	0 Amp (5%)	0W

Expansion board power limits

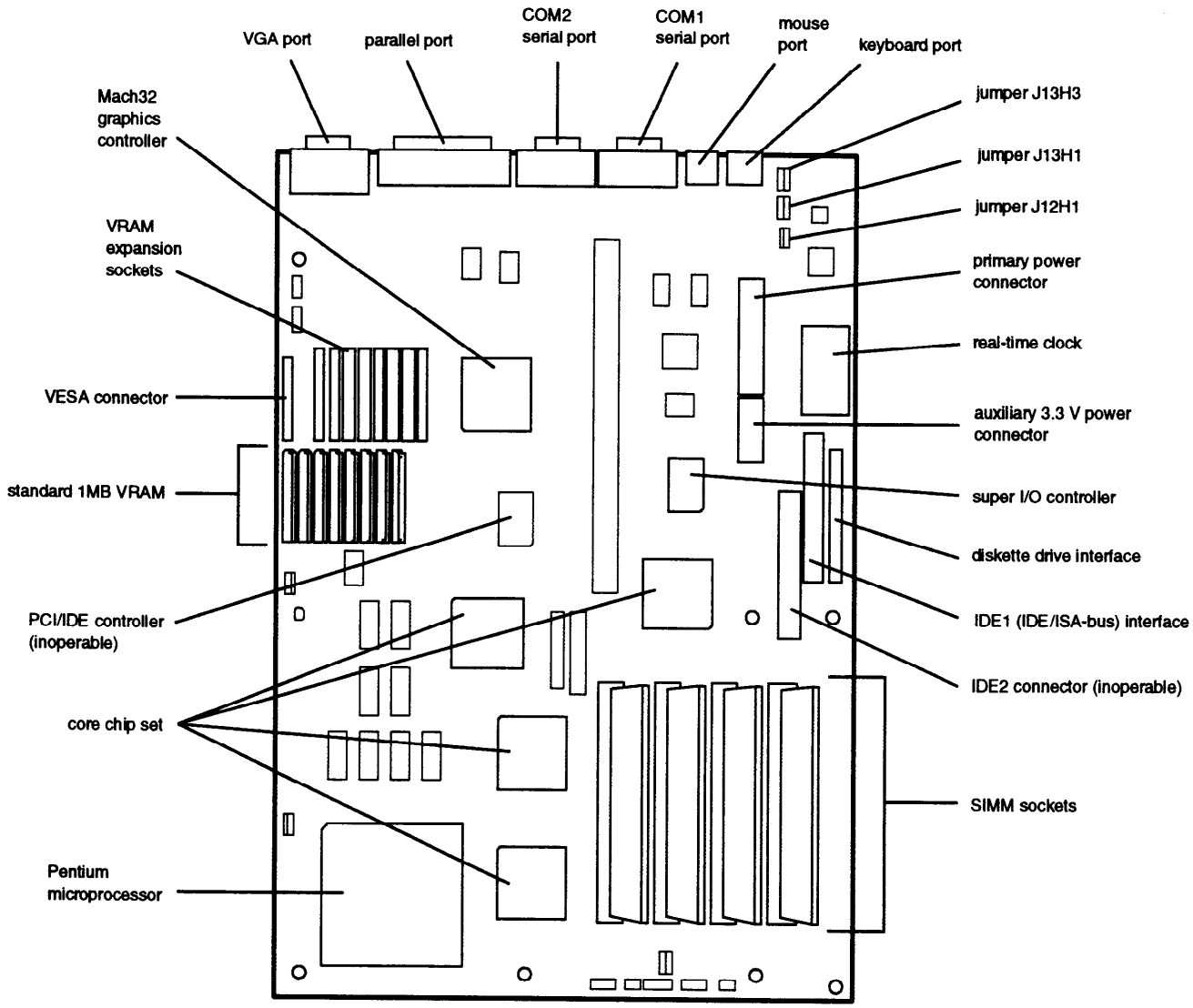
	Maximum current per board				
Board type	–5V	+5V	+12V	–12V	+3.3V
PCI (57.8 W per slot)	—	5 Amps	500 ma	100 ma	7.6 Amps
ISA (16-bit; 66 W per slot)	1.5 Amps	4.5 Amps	1.5 Amps	1.5 Amps	—

To avoid damage to the system board or power supply, do not exceed a total of 145 Watts power draw.

Environmental Requirements

Condition	Operating	Non-operating
Temperature	50° to 95° F (10° to 35° C)	40° to 158° F (40° to 70° C)
Humidity (no hard disk drive)	80% RH at 36° C	92% RH at 36° C
Altitude	10,000 ft (3048 m)	50,000 ft (15,240 m)

Main System Board Map



System board components and connectors

Socket	Component
J11H1	Power connector
J12H1	Flash recovery jumper
J12H1	BIOS upgrade/write-protect jumper
J13A1	Video connector
J13C1	Parallel port connector
J13E1	COM2 connector
J13F1	COM1 connector
J13G1	Mouse connector
J13H1	CMOS clear jumper
J13H1	Password enable/disable jumper
J13H3	Monitor jumper
J13H3	Setup entry/write-protect jumper
J13H5	Keyboard connector
J1DA1	VESA feature connector
J1F1	Speaker
J1F2	Reset
J1F3	Keyboard/power LED
J1G1	Hard disk drive LED
J1G2	Turbo switch
J1H1	Turbo LED
J3A1	Auxiliary fan
J4F1, J4G1	SIMM bank 1
J4H1, J4H2	SIMM bank 0
J7A1	CPU clock speed jumper (DO NOT CHANGE SETTING)
J7H1	PCI IDE connector (inoperable)
J8J1	Diskette drive connector
J8J2	AT IDE hard disk drive connector
J9F1	Riser card connector
J9H1	Power connector
U10B5, U10C1	Video VRAM upgrade sockets
U10G1	BIOS
U10J1	Real-time clock
U2B1	Processor

Jumper Settings

Main system board jumper settings

Jumper number	Settings	Function
J12H1	1-2	Flash memory recovery mode; allows recovery of the default BIOS if it is corrupted during an upgrade
	2-3 *	Normal flash memory operation
	4-5	Enable BIOS upgrades to the flash memory
	5-6 *	Write protect the flash memory to prevent BIOS upgrades
J13H1	1-2 *	Normal CMOS operation
	2-3	Clear current CMOS settings to reset to the factory default settings
	4-5 *	Enable the current password
	5-6	Disable the current password
J13H3	1-2	Monochrome monitor is installed
	2-3 *	Color monitor is installed
	4-5 *	Enable entry into the Setup program
	5-6	Disable entry into the Setup program

* Factory setting

SIMM Installation

Your computer comes with 8MB of memory on two 4MB SIMMs. You can increase the memory up to 128MB using 1MB, 2MB, 4MB, 8MB, 16MB, and 32MB SIMMs (when readily available).

The SIMM sockets are organized in two banks (Bank 0 and Bank 1) consisting of two sockets each. You must install the same type of SIMM in a bank.

The SIMMs you install must be 32-bit or 36-bit, 72-pin, 70ns, tin-plated, fast-page mode, parity/no parity DRAM. The table below lists the 16MB and 32MB SIMMs that are approved for use in your system. You can install these SIMMs or their equivalents.

Manufacturer	Description	Part number
Samsung	16MB; with parity	KM41C00BJ-7
Samsung	16MB; no parity	KMM5324000BG-7
Hitachi	32MB; with parity	HM5117400J7

The table below lists possible combinations of SIMMs you can install; do not use any configuration other than one of those listed in the table.

SIMM configurations

Bank 0		Bank 1		
J4H1	J4H2	J4G1	J4F1	Total memory
4MB	4MB			8MB *
4MB	4MB	1MB	1MB	10MB
4MB	4MB	2MB	2MB	12MB
4MB	4MB	4MB	4MB	16MB
4MB	4MB	8MB	8MB	24MB
4MB	4MB	16MB	16MB	40MB
4MB	4MB	32MB	32MB	72MB
8MB	8MB	1MB	1MB	18MB
8MB	8MB	2MB	2MB	20MB
8MB	8MB	4MB	4MB	24MB
8MB	8MB	8MB	8MB	32MB
8MB	8MB	16MB	16MB	48MB
8MB	8MB	32MB	32MB	80MB
16MB	16MB	1MB	1MB	34MB
16MB	16MB	2MB	2MB	36MB
16MB	16MB	4MB	4MB	40MB
16MB	16MB	8MB	8MB	48MB
16MB	16MB	16MB	16MB	64MB
16MB	16MB	32MB	32MB	96MB
32MB	32MB	1MB	1MB	66MB
32MB	32MB	2MB	2MB	68MB
32MB	32MB	4MB	4MB	72MB
32MB	32MB	8MB	8MB	80MB
32MB	32MB	16MB	16MB	96MB
32MB	32MB	32MB	32MB	128MB

* Factory configuration

Video Memory, Modes, and Monitors

This system comes with 1MB of VRAM soldered on the main system board. You can increase the video memory to 2MB by installing eight VRAM ZIP chips (256KB x 4, 60ns, fast-page mode). You must fill all eight sockets.

The table below lists the video modes supported by the system.

Resolutions and colors

Resolution	Color depth bpp(1)	Vertical Hz (refresh rate)	Horizontal Hz	1MB support	2MB support
640x480	8	60	31.5	Y	Y
640x480	8(2)	72	37.0	Y	Y
640x480	8(3)	72	44.6	Y	Y
640x480	16	60	31.5	Y	Y
640x480	16	72	37.0	Y	Y
640 × 480	16	72	44.6	Y	Y
640 × 480	24	60	31.5	Y	Y
640 × 480	24	72	37.0	Y	Y
640 × 480	24	72	44.6	Y	Y
800 × 600	8	95 (4)	33.8	Y	Y
800 × 600	8	56	35.2	Y	Y
800 × 600	8	60	37.9	Y	Y
800 × 600	8	70	44.5	Y	Y
800 × 600	8	72	48.0	Y	Y
800x600	8	76	52.4	Y	Y
800x600	16	95 (4)	33.8	Y	Y
800x600	16	56	35.2	Y	Y
800 × 600	16	70	44.5	N	Y
800 × 600	16	72	48.0	N	Y
800 × 600	16	76	52.4	N	Y
800 × 600	24	95 (4)	33.8	N	Y
800 × 600	24	56	35.2	N	Y
800 × 600	24	60	37.9	N	Y
800 × 600	24	70	44.5	N	Y
800x600	24	72	48.0	N	Y
1024x768	8	87 (4)	35.5	Y	Y
1024x768	8	60	48.4	Y	Y
1024x768	8	66	53.9	Y	Y
1024x768	8	70	56.1	Y	Y
1024x768	8	72	57.9	Y	Y
1024x768	8	76	61.4	Y	Y
1024x768	16	87 (4)	35.5	N	Y
1024x768	16	60	48.4	N	Y
1024 × 768	16	66	53.9	N	Y
1024 × 768	16	70	56.1	N	Y
1024 × 768	16	72	57.9	N	Y
1024 × 768	16	76	61.4	N	Y
1280 × 1024	4/8	87 (4)	50.0	N	Y
1280 × 1024	4/8	95 (4)	50.0	N	Y
1280 × 1024	8	60	64.0	N	Y
1280 × 1024	8	70	74.6	N	Y
1280 × 1024	8	74	81.1	N	Y

(1) bpp=bits per pixel: 4 bpp=16 colors, 8 bpp=256 colors, 16 bpp=65,000 colors, 24 bpp=16.7 million colors

(2) 32 MHz setting

(3) 40 MHz setting

(4) Interlaced

The table below lists the monitors that are directly supported by the Mach32 accelerator.

Check the monitor documentation to see if its characteristics match one of the listed types. If so, select that type in the Mach32 installation program.

For EPSON monitors, see the second table for information on the monitor type to select.

If the monitor does not match any of these types, set up a custom monitor.

Mach32 monitor list

Monitor	640 × 480	800 × 600	1024 × 768	1280 × 1024
VGA or PS/2	60 Hz	—	—	—
IBM 8514/A	60 Hz	95 Hz *	87 Hz *	—
NEC 5FG/6FG	72 Hz	76 Hz	76 Hz	70 Hz
NEC4FG	72 Hz	70 Hz	70 Hz	87 Hz *
NEC 3FGx	72 Hz	60 Hz	87 Hz *	—
NEC 5D	72 Hz	72 Hz	72 Hz	60 Hz
NEC 4D/5D	72 Hz	72 Hz	70 Hz	87 Hz *
NEC 4D	60 Hz	60 Hz	70 Hz	87 Hz *
NEC 3D	60 Hz	60 Hz	87 Hz *	—
MAG MX17F	60 Hz	72 Hz	70 Hz	60 Hz
MAG MX15H	60 Hz	72 Hz	60 Hz	60 Hz
NANAO/EIZO F340iW	72 Hz	76 Hz	76 Hz	56 Hz
NANAO 9070U-US	60 Hz	72 Hz	60 Hz	—
NANAO 9080i	72 Hz	72 Hz	76 Hz	87 Hz *
MITS HA3905ADK	60 Hz	95 Hz *	87 Hz *	—
MITS HL6935TK	72 Hz	72 Hz	72 Hz	—
JVC GDH8121SHW	60 Hz	72 Hz	76 Hz	60 Hz
Sony CPD1304	72 Hz	70 Hz	60 Hz	—

* Interlaced

EPSON monitor types

EPSON monitor	Select type	640 × 480	800 × 600	1024 × 768	1280 × 1024
14" VGA monochrome (A880611)	VGA or PS/2 (default)	60 Hz	—	—	—
15" Extended VGA (A804211)	Custom	72Hz	72Hz	70 Hz	—
17" Professional Series (A804241)	Custom	72Hz	72Hz	70 Hz	—
20" Professional Series II (A804341)	Custom	72Hz	72Hz	75 Hz	76 Hz

Hard Disk Drive Types

This system comes with a hard disk auto-sensing feature. Some drives do not support the auto-sensing feature. If the system does not correctly define your hard disk drive, you can define up to two drive types in SETUP.

Drive Option Information

Hard disk drive options for l-inch IDE drives

Parameters	Connor				Quantum	Western Digital	
	CP-30254	CP-30344	CFS420A	CFA540A	LPS240AT	AC2250	AC2340
Formatted capacity (MB)	250	340	426.3	540	245	240	340
Size, width x height (in)	4 x 1	4 x 1	4 x 1	4 x 1	4 x 1	3.5 x 1	3.5 x 1
Weight (lbs)	1.2	1.2	1.16	1.16	1.05	1.12	1.12
Cylinders	1895	2116	2388	2805	1818	2233	2233
Disks	2	2	2	2	2	2	2
Heads	4	4	4	4	4	3	4
Sectors per track	62	63-95	63-100	72-114	44-87	56-96	56-96
Rotational speed (RPM)	4542	4500	3600	4500	4306	3322	3322
Buffer size (KB)	64	64	32	256	256	64	128
Average seek time (ms)	14	13	14	12	16	<13	<13
Encoding method	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7
Power dissipation (seek)	3.75 W	3.75 W	5.12 W	5.7 W	4.9 W	5.2 W	5.2 W
Logical parameters							
Cylinders	895	655	826	1048	723	1010	1010
Heads	10	16	16	16	13	9	12
Precomp zone	0	0	0	0	none*	1011	1011
Landing zone	895	655	826	1048	723	1011	1011
Sectors	55	63	63	63	51	55	55

- Select 1 or none for the precomp value. If neither of these options are available, select the maximum available precomp value.

IDE hard disk drive jumper settings

Model number	Single drive	Master drive	Slave drive
Conner CP30254	C/D jumpered	C/D jumpered	No jumpers
Conner CR30344	C/D jumpered	C/D jumpered	No jumpers
Conner CFS420A	C/D jumpered	C/D jumpered	No jumpers
Conner CFA540A	C/D jumpered	C/D jumpered	No jumpers
Quantum LPS240AT	DS jumpered*	SP and DS jumpered*	No jumpers l
Western Digital AC2250	No jumpers	MA jumpered	SL jumpered
Western Digital AC2340	No jumpers	MA jumpered	SL jumpered

- CS (cable selection) can be jumpered for any configuration. When Cs is used, the drive is a master if pin 28 is grounded and a slave if pin 28 is not grounded.

Diskette drive options

Parameters	3.5" 1.44MB TEAC FD-235HF
Storage capacity	1474KB (formatted)
Size, width x height (in)	3.5 x 1
Cylinders	80
Heads	2
Tracks	160
Track density	135 TPI
Power-on ready time	480 ms or less
Setting time	15 ms
Average latency time	100 ms

System Memory Map

Address range (hexadecimal)	Size	Description
1000000-7FFFFFF	112MB	Extended memory
FE0000-FFFFFF	128KB	System and video BIOS copy
100000-FDFFFF	15232KB	Extended memory
F0000-FFFFF	64KB	System BIOS
EE000-EFFFF	8KB	Flash boot block (available as HIMEM)
ED000-EDFFF	4KB	User flash area (available as HIMEM if no user information is here)
E8000-ECFFF	20KB	Setup program (disable via setup pre-boot only; this option open to HIMEM)
E0000-E7FFF	32KB	Available Hi DOS
C8000-DFFFF	96KB	Available Hi DOS memory (open to the ISA bus)
C000-C7FFF	32KB	VGA BIOS
B8000-BFFFF	32KB	VGA display memory (not available to ISA bus)
B0000-B7FFF	32KB	VGA & mono display memory (HIMEM with QEMM not available to the bus)
A0000-AFFFF	64KB	VGA display memory (not available to the ISA bus)
9FC00-9FFFF	1 KB	Extended BIOS data (moveable by QEMM and 386MAX)
80000-9FBFF	127KB	Extended conventional
00000-7FFFF	512KB	Conventional

System I/O Addresses

Address range (hexadecimal)	Description
0000-000F	SIO-DMA
0020-0021	SIO-interrupt controller 1
0040-0043	SIO-timer 1
0048-0048	SIO-timer 2
0060	Keyboard controller data byte
0061	SIO-NMI, speaker control
0064	Keyboard controller, CMD & STATUS byte
0070, bit 7	SIO-enable NMI
0070, bits 6:0	SIO-RTC, address
0071	SIO-RTC, data
0073	Reserved: board configuration
0075	Reserved: board configuration
0078	SIO-BIOS timer
0080-008F	SIO-DMA
00A0-00A1	SIO-interrupt controller 2
00C0-00DE	SIO-DMA
00F0	Reset numeric error
01F0-01F7	IDE channel 1
0278-027B	Parallel port 3
02E8-02EF	Serial port 4
02F8-02FF	Onboard serial port 3
0378-037F	Parallel port 2
03BC-03BF	Onboard parallel port
03E8-03EF	Serial port 3
03F0-03F5	Floppy channel 1
03F6	IDE channel 1
03F7	Diskette (write) channel 1
03F7, bit 7	Diskette change channel 1
03F7, bits 6:0	IDE status channel 1
03F8-03FF	Onboard serial port 1
0CF8	PCI configuration space enable
0CF9	Deturbo mode enable

System I/O addresses (continued)

Address range (hexadecimal)	Description
C000-C0FF	82434LX configuration registers
C200-C2FF	823781B configuration registers
C300-C3FF	Onboard ATI configuration registers

System Board Interrupts

Interrupt request (IRQ)	System resource
NMI	Panty error
0	Reserved, interval timer
1	Resewed, keyboard buffer full
2	Reserved, cascade interrupt from **slave** PIC
3	Serial port 2
4	serial port 1
5	Parallel port 2
6	Diskette
7	Parallel port 1
8	Real-time dock
9	User-available
10	User-available
11	User-available
12	Onboard mouse port if enabled; otherwise user-available
13	Reserved, math coprocessor
14	IDE if enabled; otherwise user-available
15	User-available

DMA Channels

DMA channel	System resource
0	Open
1	Open; normally used for LAN
2	Diskette drive
3	IDE hard disk drive
4	Reserved; cascade channel
5	Open
6	Open
7	Open

Connector Pin Assignments

Parallel port connector pin assignments (J13C1)

Pin	Signal name	Pin	Signal name
1	Strobe–	14	Ground
2	Auto Feed–	15	Data Bit 6
3	Data Bit 0	16	Ground
4	Error–	17	Data Bit 7
5	Data Bit 1	18	Ground
6	Init–	19	Ack–
7	Data Bit 2	20	Ground
8	Slct In–	21	BUSY
9	Data Bit 3	22	Ground
10	Ground	23	PE (Paper End)
11	Data Bit 4	24	Ground
12	Ground	25	SLCT

Serial port connector pin assignments (J13E1, J13F1)

Pin	Signal name	Pin	Signal name
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In–	8	RI
4	RTS	9	GND
5	Serial Out–	10	NC

Primary power connector pin assignments (J11H1)

Pin	Name	Function
1	PWRGD	Power good
2	+5 V	+5 V Vcc
3	+12 V	+12 V
4	–12 V	–12 V
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	–5 V	–5 V
10	+5 V	+5 V Vcc
11	+5 V	+5 V Vcc
12	+5 V	+5 V Vcc

Auxiliary (3.3V) power connector pin assignments (J9H1)

Pin	Name	Function
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	+3.3 V	+3.3 V
5	+3.3 V	+3.3 V
6	+3.3 V	+3.3 V

Diskette drive connector pin assignments (J8J1)

Pin	Signal name	Pin	Signal name
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index–
9	Ground	10	Motor Enable A–
11	Ground	12	Drive Select B–
13	Ground	14	Drive Select A–
15	Ground	16	Motor Enable B–
17	Ground	18	DIR–
19	Ground	20	STEP–
21	Ground	22	Write Data–
23	Ground	24	Write Gate–
25	Ground	26	Track 00–
27	Ground	28	Write Protect–
29	Ground	30	Read Data–
31	Ground	32	Side 1 Select–

AT IDE hard disk drive connector pin assignments (J8J2)

Pin	Signal name	Pin	Signal name
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	16	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write-	24	Ground
25	I/O Read-	26	Ground
27	IOCHRDY	28	BALE
29	DACK3-	30	Ground
31	IRQ14	32	IOCS16-
33	Addr 1	34	Ground
35	Addr 0	36	Addr 2
37	Chip Select 0-	38	Chip Select 1-
39	Activity	40	Ground

Speaker connector pin assignments (J1F1)

Pin	Signal name
1	SPKR_DAT
2	Key
3	No Connect
4	+5V Vcc

Auxiliary 12 V front fan connector pin assignments (J3A1)

Pin	Signal name
1	Ground
2	+12V (fused)
3	Ground

ISA expansion hard connector pin assignments

Pin	Signal name	Pin	Signal name
B1	GND	A1	IOCHK–
B2	RSTDRV	A2	SD7
B3	Vcc	A3	SD6
B4	IRQ9	A4	SD5
B5	–5V	A5	SD4
B6	DRQ2	A6	SD3
B7	–12V	A7	SD2
B8	0WS–	A8	SD1
B9	+12V	A9	SD0
B10	GND	A10	IOCHRDY
B11	SMEMW–	A11	AEN
B12	SMEMR–	A12	SA19
B13	IOW–	A13	SA18
B14	IOR–	A14	SA17
B15	DACK3–	A15	SA16
B16	DRQ3	A16	SA15
B17	DACK1–	A17	SA14
B18	DRQ1	A18	SA13
B19	REFRESH–	A19	SA12
B20	SYSCLK	A20	SA11
B21	IRQ7	A21	SA10
B22	IRQ6	A22	SA9
B23	IRQ5	A23	SA8
B24	IRQ4	A24	SA7

ISA expansion board connector pin assignments (continued)

Pin	Signal name	Pin	Signal name
B25	IRQ3	A25	SA6
B26	DACK2–	A26	SA5
B27	TC	A27	SA4
B28	BALE	A28	SA3
B29	Vcc	A29	SA2
B30	OSC	A30	SA1
B31	GND	A31	SA0
KEY		KEY	
D1	MEMCS16–	C1	SBHE–
D2	IOCS16–	C2	LA23
D3	IRQ10	C3	LA22
D4	IRQ11	C4	LA21
D5	IRQ12	C5	LA20
D6	IRQ15	C6	LA19
D7	IRQ14	C7	LA18
D8	DACK0–	C8	LA17
D9	DRQ0	C9	MEMR–
D10	DACK5–	C10	MEMW–
D11	DRQ5	C11	SD8
D12	DACK6–	C12	SD9
D13	DRQ6	C13	SD10
D14	DACK7–	C14	SD11
D15	DRQ7	C15	SD12
D16	Vcc	C16	SD13
D17	Master–	C17	SD14
D18	GND	C18	SD15

PCI expansion board connector pin assignments

Pin	Signal name	Pin	Signal name	Pin	Signal name	Pin	Signal name
A1	GND	B1	–12V	A32	AD16	B32	AD17
A2	+12V	B2	No Connect	A33	3.3V	B33	CBE2–
A3	No Connect	B3	GND	A34	FRAME–	B34	GND
A4	No Connect	B4	No Connect	A35	GND	B35	IRDY–
A5	Vcc	B5	Vcc	A36	TRDY–	B36	3.3V
A6	PCIINT3–	B6	Vcc	A37	GND	B37	DEVSEL–
A7	PCIINT1–	B7	PCIINT2–	A38	STOP–	B38	GND
A8	Vcc	B8	PCIINT4–	A39	3.3V	B39	PLOCK–
A9	Reserved	B9	No Connect	A40	SDONE	B40	PERR–
A10	Vcc	B10	Reserved	A41	SBO–	B41	3.3V
A11	Reserved	B11	No Connect	A42	GND	B42	SERR–
A12	GND	B12	GND	A43	PAR	B43	3.3V
A13	GND	B13	GND	A44	AD15	B44	CBE1–
A14	Reserved	B14	Reserved	A45	3.3V	B45	AD14
A15	SPCIRST–	B15	GND	A46	AD13	B46	GND
A16	Vcc	B16	PCLKE	A47	AD11	B47	AD12
A17	AGNT–	B17	GND	A48	GND	B48	AD10
A18	GND	B18	REQA–	A49	AD9	B49	GND
A19	Reserved	B19	Vcc	A50	KEY	B50	KEY
A20	AD30	B20	AD31	A51	KEY	B51	KEY
A21	3.3V	B21	AD29	A52	CBEO–	B52	AD8
A22	AD28	B22	GND	A53	3.3V	B53	AD7
A23	AD26	B23	AD27	A54	AD6	B54	3.3V
A24	GND	B24	AD25	A55	AD4	B55	AD5
A25	AD24	B25	3.3V	A56	GND	B56	AD3
A26	AD22 (IDSEL)	B26	CBE3–	A57	AD2	B57	GND
A27	3.3V	B27	AD23	A58	AD0	B58	AD1
A28	AD22	B28	GND	A59	Vcc	B59	Vcc

PCI expansion board connector pin assignments (continued)

Pin	Signal name	Pin	Signal name	Pin	Signal name	Pin	Signal name
A29	AD20	B29	AD21	A60	SREQ64–	B60	SACK64–
A30	GND	B30	AD19	A61	Vcc	B61	Vcc
A31	AD18	B31	3.3V	A62	Vcc	B62	Vcc

Mouse and keyboard connector pin assignments (J13G1 and J13H5)

Pin	Signal name
1	Data
2	No connect
3	Ground
4	Vcc (fused)
5	Clock
6	No connect

Reset connector pin assignments (J1F2)

Pin	Signal name
1	RESET
2	Ground

Power LED connector pin assignments (J1F3)

Pin	Signal name
1	LED PWR
2	Key
3	Ground
4	KEY LOCK
5	Ground

Hard disk drive LED connector pin assignments (J1G1)

Pin	Signal name
1	PULL UP 330
2	HD ACTIVE-
3	Key
4	PULL UP 330

Turbo LED connector pin assignments (J1H1)

Pin	Signal name
1	PULL UP 330
2	LED TURBO

Video monitor port connector pin assignments (J13A1)

Pin	Signal name	Pin	Signal name	Pin	Signal name
1	Red	6	Ground	11	No connect
2	Green	7	Ground	12	No connect
3	Blue	8	Ground	13	Horizontal sync.
4	No connect	9	No connect	14	Vertical sync.
5	Ground	10	Ground	15	No connect

VESA feature connector pin assignments (J10A1)

Pin	Signal name	Pin	Signal name
1	Ground	2	Data 0
3	Ground	4	Data 1
5	Ground	6	Data 2
7	Data enable	8	Data 3
9	Sync enable	10	Data 4
11	PCLK enable	12	Data 5

VESA feature connector pin assignments (J10A1) (continued)

Pin	Signal name	Pin	Signal name
13	Vcc	14	Data 6
15	Ground	16	Data 7
17	Ground	18	PCLK
19	Ground	20	Blank
21	Ground	22	Blank
23	Vcc	24	Blank
25	Blank	26	Ground

Error Messages

Beep codes

Number of beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry on the main system board is faulty
2	Parity E nor	Parity error In the first 64KB of memory
3	Base 64KB Memory Failure	Memory failure in the first 64KB of memory
4	Timer Not Operational	Memory failure in the first 64KB of memory or Timer 1 on the main system board is not functioning
5	Processor Error	The CPU generated an error
6	8042 - Gate A20 Failure	The keyboard controller may be bad; the BIOS cannot switch to protected mode
7	Processor Exception Interrupt Error	The CPU generated an exception interrupt
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty: not a fatal error
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in the BIOS
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed
11	Cache Error/External Cache Bad	The external cache is faulty

Error messages

Message	Description
8042 Gate – A20 Error	Gate A20 on the keyboard controller is not working; replace the controller
Address Line Short!	Error in the address decoding circuitry on the main system board
Cache Memory Bad, Do Not Enable Cache!	Cache memory is defective; replace it
CH-2 Timer Error	Error in timer 2
CMOS Battery State Low	The CMOS RAM battery power is low; replace the battery
CMOS Checksum Failure	The previous CMOS RAM checksum value is different from the current value; run Setup
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent; run Setup
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected by the BIOS; run Setup
CMOS Memory Size Mismatch	The amount of memory on the main system board is different than the amount in CMOS RAM; run Setup
CMOS Time and Date Not Set	Run Setup to set the date and time in CMOS RAM

Error messages (continued)

Message	Description
Diskette Boot Failure	The boot diskette in drive A is corrupt and cannot be used to boot the system; use another diskette and follow the screen instructions
DMA Error	Error in the DMA controllers
DMA #1 Error	Error in the first DMA controller
DMA #2 Error	Error in the second DMA controller
FDD Controller Failure	The BIOS cannot communicate with the diskette drive controller; check all appropriate connections after you turn off the system
HDD Controller Failure	The BIOS cannot communicate with the hard disk drive controller; check all appropriate connections after you turn off the system
INTR #1 Error	Interrupt controller 1 failed POST
INTR #2 Error	Interrupt controller 2 failed POST
Invalid Boot Diskette	The BIOS can read the diskette in drive A, but cannot boot the system; use another diskette
Keyboard is Locked...Unlock It	The keyboard lock is enabled; unlock it to continue
Keyboard Error	There is a timing problem with the keyboard; set the **Keyboard** option in Setup to **Not Installed** to skip the keyboard self test
KB/Interface Error	There is an error in the keyboard connector
Off Board Parity Error	Parity error in memory installed in an expansion slot. The format is: **OFF BOARD PARITY ERROR ADDR (HEX) = (*XXXX*)** *XXXX* is the hex address where the error occurred
Onboard Parity Error	Parity error in memory installed in a SIMM slot. The format is: **ON BOARD PARITY ERROR ADDR (HEX) = (*XXXX*)** *XXXX* is the hex address where the error occurred
Parity Error ????	Parity error in system memory at an unknown address

ISA NM messages

ISA NMI message	Description
Memory Parity Eror at *xxxxx*	Memory failed; if the memory location can be determined, it is displayed as xxxxxx; if not, the message is Memory Parity Error ????
I/O Card Parity Error at *xxxxx*	An expansion card failed; if the address can be determined, it is displayed as xxxxx: if not, the message is I/O card Parity Error ????
DMA Bus Time-out	A device has driven the DMA bus signal for more than 7.8 microseconds

Tested Operating Environments

Although the system will run most software applications, the following operating environments have been tested for compatibility with this system.

Microsoft MS-DOS
Novell DR DOS 6.0
Novell NetWare 2.2, 3.12, and 4.01
Novell NetWare Lite 1.1
IBM OS/22.1
SCO UNIX release 3.2, version 4.2
SCO Open Desktop 3.0
Microsoft Windows 3.0 and 3.1
Microsoft Windows for WorkGroups 3.11
Microsoft Windows NT 3.1
NextStep version 3.2
LAN Manager

This system has also received Novell's 'Yes, NetWare tested and approved" certification as a workstation and file server. As new environments become available, these also will be tested and certified.

Installation/Support Tips

System Power Requirements

If the power cord supplied with the system is not compatible with the electrical outlet, obtain a cord that meets these criteria :

- ❑ The cord must be rated for at least 125% of the current rating of the AC voltage system.
- ❑ The cord must be less than 4.5 meters (14.8 feet) long.
- ❑ The connector that plugs into the electrical outlet must be an appropriately designed male grounding-type connector.
- ❑ The connector that plugs into the computer must be an IEC type CEE-22 female connector.

Do not use or attempt to modify the supplied AC power cord if it is not the type required for use in your region.

To avoid permanent damage to the computer, be sure the voltage selector switch is set to the correct input line voltage before you turn on the power. Verify that the voltage selector switch is set to the correct setting. The 115 VAC setting is appropriate for line source voltages between 100 and 120 VAC. If the line source voltage in your location is between 200 and 240 VAC, make sure you set the switch to 230 VAC.

To avoid damage to the system board or power supply, do not exceed a total of 145 Watts power draw.

Keyboard and Monitor

Even if you intend to use this system as a network file server, you need to connect a monitor and a keyboard to complete the installation. You may remove them once the installation is complete.

Mouse and Keyboard

When connecting the mouse and keyboard, be careful to plug them into the proper ports. Although they are physically identical, they are not interchangeable, and damage may occur to the ports or the main system board.

Expansion Boards

If you are installing a video expansion board containing a secondary controller, it must be an MDA or CGA card with no BIOS. You must use the computer's built-in VGA controller as the primary controller.

You must install an expansion slot cover on any vacant expansion slots to maintain the electromagnetic emissions and cooling characteristics of the system.

IBM 16/4 Token Ring Network Adapters

Do not install Type 1 of the IBM 16/4 Token Ring network adapter in the computer because the adapter will not correctly initialize. You can install the Type 3 adapter if you disable the appropriate shadow memory area and assign the correct IRQ 9 setting (if you use IRQ 2). For example, if you set the adapter's ROM address to DC000h, the RAM address to D8000h, the RAM size to 16KB, and the IRQ setting to IRQ 2, you must make the following changes to these Advanced CMOS Setup options:

Disable Shadow Memory Base option:	Set to D8000h
Disable Shadow Memory Size option:	Set to 32KB
ISA IRQ 9 option:	set to used

Information Reference List

Engineering Change Notices

None.

Technical Information Bulletins

None.

Product Support Bulletins

None.

Related Documentation

TM-ENDVRP60	EPSON Endeavor P60 Service Manual
PL-ENDVRP60	EPSON Endeavor P60 Parts Price List
400304600	EPSON Endeavor P60 User's Guide